

December 20, 2007

Project No. 1155.001

Ms. Jennifer L. Wiley, PG, CEM
THE BOEING COMPANY
Environment, Health & Safety – Environmental Remediation
4501 Conant Street
Long Beach, California 90808

Field Data Report

December 2007 Baseline and Quarterly Groundwater Monitoring
Former Building 1/36 Biorecirculation Pilot Test

Waste Discharge Requirements Order No. R4-2007-0040

Boeing Corporate Real Estate Former C-6 Facility

Los Angeles, California

Dear Ms. Wiley:

This report has been prepared by Avocet Environmental, Inc. (Avocet) to summarize and present the field data collected during the December 2007 Baseline Waste Discharge Requirements (WDR) and Quarterly groundwater monitoring event at the Boeing Corporate Real Estate (BCRE) Former C-6 Facility in Los Angeles, California. This monitoring was conducted pursuant to and in accordance with the following:

Avocet Environmental, Inc., December 1, 2007, Proposal for December 2007 Building 1/36 Pilot System Baseline Monitoring and Quarterly Sampling Plan, Boeing Former C-6 Facility, Los Angeles, California.

California Regional Water Quality Control Board – Los Angeles Region (LARWQCB), August 10, 2007, Waste Discharge Requirements for Pilot Tests to Evaluate Bioremediation of Volatile Organic Compounds (VOCs) in Groundwater, Boeing Realty Corporation, Former C-6 Facility, 19503 South Normandie, Los Angeles, California (File No. 95-036; SLIC No. 410; Site ID No. 1846000).

Camp Dresser & McKee, Inc., (CDM), November 26, 2007, December 2007, Building 1/36 Pilot System Baseline Monitoring and Quarterly Sampling Plan, Boeing Former C-6 Facility, Los Angeles, California (Attachment 1).

CDM, February 5, 2007, Groundwater Monitoring Workplan, 2007, Former C-6 Facility, 19503 South Normandie Avenue, Los Angeles, California.

Field activities performed during the December 2007 Monitoring Program are discussed in the following sections. Figure 1 presents the locations of the groundwater monitoring wells included as part of this program.

16 Technology Drive, Suite 154 \* Irvine, California 92618-2327
Phone 949.296.0977 \* Fax 949.296.0978
www.avocetenv.com

# Field Data Report December 2007 Baseline WDR and Quarterly Groundwater Monitoring

BCRE Former C-6 Facility
Los Angeles, California

Page 2 December 20, 2007

### GOUNDWATER SAMPLING ACTIVITIES

Two out of the three wells scheduled for gauging were gauged for depth to water and total depth on December 12, 2007. One of the three wells, EWB001, is equipped with a permanent pump and was inaccessible to sounding equipment. Depth to water and total depth for this well were estimated from the pressure transducer and well construction records<sup>1</sup>. These wells were also inspected for any damage or missing materials.

Three wells were sampled on December 12, 2007 using a variety of pumps and methods. Wells EWC001 and EWB001 were purged for sampling using electric submersible pumps and traditional purge rates and values (i.e., three wetted casing volumes). Well EWB002 was purged for sampling using a pneumatic bladder pump and the low-flow (minimal drawdown: 0.2 liters/minute) sampling method. Stabilization parameters were measured at all three wells using a calibrated Horiba U-22 water quality meter with a flow-through cell. Ferrous iron testing was performed in all wells using HACH DR/890 Colorimeter and the Horiba dissolved oxygen measurements were confirmed periodically using a CHEMetrics Inc. test kit. The field instruments were calibrated daily and the calibration data sheets are included in Attachment 2.

At the completion of purging, groundwater samples were collected in laboratory supplied containers, properly labeled, identified on the chain-of-custody, and submitted to TestAmerica Laboratory, an appropriately certified environmental testing laboratory located in Irvine, California. A normal 10-day turn-around time was requested for the lab analyses. Samples from all three wells were analyzed for the following:

Volatile organic compounds (VOCs) by EPA Method 8260B.

Samples from well EWB002 were scheduled for the following additional analytes:

- Total organic carbon (TOC) by EPA Method 9060,
- Volatile fatty acids (VFAs) by IC Method 8M23G (subcontracted by TestAmerica to Microseeps, Inc., Pittsburg, PA),
- Dissolved gases (ethane, ethane, and methane) by RSK 175 (subcontracted by TestAmerica to Air Technology Laboratory, Inc., City of Industry, CA),
- Dissolved minerals (sulfate, nitrate, nitrite, and chloride) by EPA Method 300
   Series.
- Total Alkalinity by EPA Method 310, and

<sup>1</sup> The top of casing was modified when the vault was installed. Total depth, below top of casing (BTC), prior to modification was 88.7 feet. Total depth after modification is 84.7 feet (i.e., approximately 4 feet of casing was removed - new top of casing elevation is approximately 49.01 feet above mean sea level (amsl). The well is equipped with a transducer. The transducer was installed approximately 78.15 feet BTC. On December 12, 21.6 of water covered the transducer - a water level of 56.55 feet BTC. This equates to a water table elevation on December 12 of -7.54 feet amsl.



# Field Data Report December 2007 Baseline WDR and Quarterly Groundwater Monitoring

BCRE Former C-6 Facility Los Angeles, California Page 3 December 20, 2007

 Quantitative polymerase chain reaction (qPCR) analysis for DHC 16S rRNA gene and functional genes tceA, bvcA, and vcrA (subcontracted by TestAmerica to North Wind, Inc., Pocatello, ID).

Approximately 200 gallons of purge water from well EWB001 was pumped directly into the 21,000 gallon temporary Baker tanks staged to the west and south of the treatment compound. Approximately 124 gallons of purge water from wells EWC001 and EWB002 was transported to the storage tank located in the treatment compound. Field data forms are included in Attachment 2.

### WELL INVENTORY

A comprehensive inventory of all 67 wells was conducted to assess well status. Each well was visited and the well head photographed to document the condition at the time of the visit. Photographs of the well heads are included in Attachment 2. All wells appear undamaged, readily accessible, and available for sampling, with the following exceptions:

- Two wells situated on the Sunrider property could not be located: Well MWB014 (well head photos, page 5) was likely obstructed by construction debris and Well IWC002 (well head photos, page 2) was buried beneath a small soil stockpile. Although neither of these wells was observed directly, the condition of the local area suggests that the wells are intact.
- Only one well structure was observed to be damaged. The concrete surrounding Well IWC001 is damaged, but it is unlikely that the integrity of the well has been compromised (well head photos, page 3).

If you have any questions regarding this report or require additional information, please do not hesitate to call.

Respectfully submitted,

AVOCET ENVIRONMENTAL, INC.

Muhael a Gendina Michael A. Rendina, C.Hg.

Principal

MAR:sh Attachments:

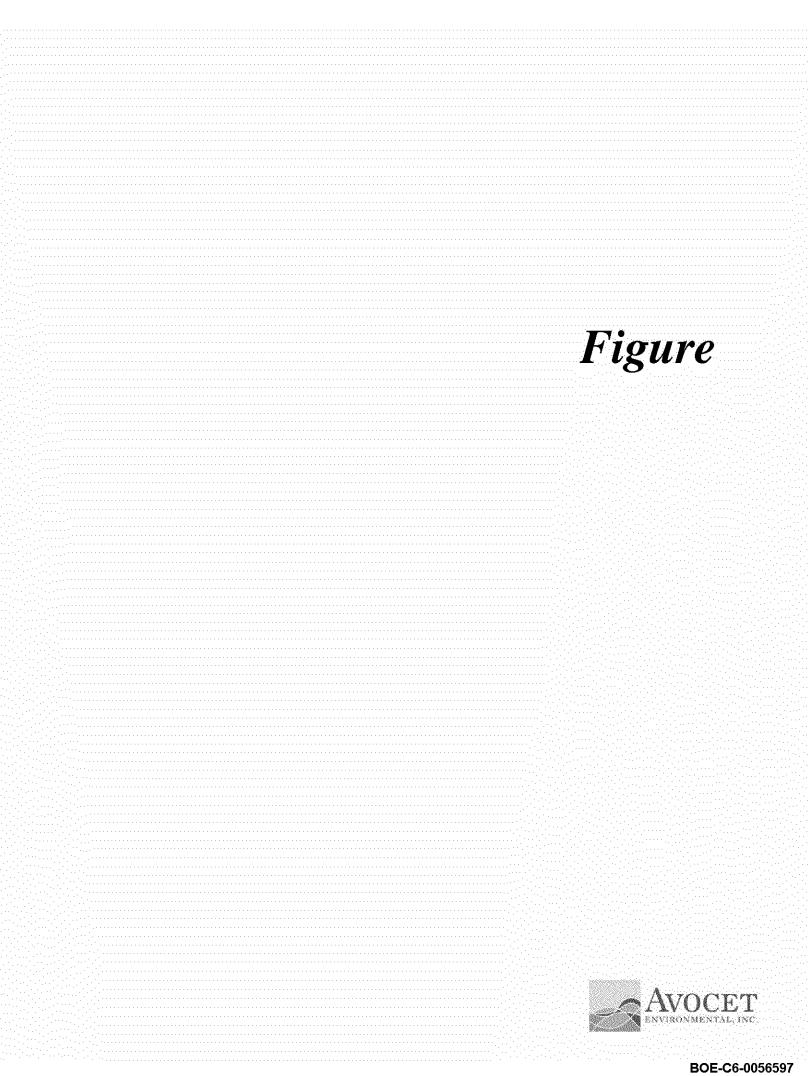
Figure: Site Map – Monitoring Well Locations

Attachment 1: December 2007 Sampling and Analysis Plan

Attachment 2: Field Data Forms and Well Head Photographs

S. Projects 1155 Bosing Former C-6 Facility Groundwater Monitoring December 2007 FDR\_December 2007\_rev.doc









### December 2007

# Building 1/36 Pilot System Baseline Monitoring and Quarterly Sampling Plan Boeing Former C-6 Facility Los Angeles, California

Table 1 presents the details of the December 2007 monitoring round for the Building 1/36 wells, which includes:

- Final round of baseline sampling of EWB002 (B-Sand Well installed in June 2007) as part of the Building 1/36 Pilot System under the Individual WDR Permit. This will also serve as the second round of quarterly monitoring for this well.
- Fourth and final round of quarterly sampling of EWC001 (C-Sand Well), which was installed in 2006.
- Third round of quarterly sampling of EWB001 (B-Sand Well), which was installed in 2006.

All wells will be gauged prior to collecting groundwater samples to determine static water levels and total well depth. Except as modified below, all procedures, including quality assurance (QA) and data validation, will be as described in the 2007 Groundwater Monitoring Work Plan (CDM, February 5, 2007).

# **Building 1/36 Pilot System Baseline Monitoring**

For EWB002, low-flow purging to maintain uniform flow rates on the order of 0.1 to 0.5 liters/min will be used to collect the groundwater sample and minimize disturbance to the groundwater in the well such that drawdown is less than 0.3 foot. The sample collected from the well will be tested for biogeochemical parameters using a YSI unit, field test kits, and fixed-base laboratory analyses. The YSI unit or equal, with flow through cell, will be used to measure pH, dissolved oxygen (DO), oxidation-reduction potential (ORP), Electrical Conductivity (EC), and temperature. A turbidity meter (Hach 2100P or equal) shall be used to monitor turbidity of the water during purging. Hach, Inc. field test kits will be used to measure ferrous iron (Fe [II]). During purging, at least pH, conductivity, turbidity, and DO should stabilize such that three successive readings should be within  $\pm$  0.1 for pH,  $\pm$  3% for conductivity, and  $\pm$  10% for turbidity and DO. During the purging, a minimum of one tubing volume (including the volume of water in the pump and flow cell) must be purged prior to recording the water-quality indicator parameters. Following field analyses, samples will be collected for laboratory analysis as shown on Table 1.



1

## **Quarterly Monitoring**

For EWC001, the purging and sampling procedures described in the 2007 Groundwater Monitoring Work Plan (CDM, February 5, 2007 will be followed. The groundwater sample from EWC001 will be collected for field testing and laboratory analysis as shown on Table 1.

Well EWB001 is equipped with a permanent well pump and cannot be sampled using conventional techniques. The sample should be collected from sample port at the discharge pipe of the well pump at the well vault. Please coordinate with CDM/Jacob Hefner & Associates <u>prior</u> to sampling this well.



### Table 1

# December 2007 Building 1/36 Pilot System Performance and Quarterly Groundwater Monitoring Plan

# Boeing Reality Corporation, Former C-6 Facility Los Angeles, California

|                             |                 |                   |                  |       | Monitori            | ng Parameters          |              |   | Dat    | Data Validation 8 |        |  |  |
|-----------------------------|-----------------|-------------------|------------------|-------|---------------------|------------------------|--------------|---|--------|-------------------|--------|--|--|
|                             | Water           | Committee         | Water            | VOCs  | Field Parameters    | Total Organic qPCR and |              |   |        |                   |        |  |  |
| Well ID                     | Bearing<br>Unit | Sampling<br>Order | Level<br>Gauging |       | _                   | _                      | Minerals 5,6 |   | Tier 1 | Tier 2            | Tier 3 |  |  |
|                             |                 |                   |                  |       |                     |                        |              |   |        |                   |        |  |  |
| EWB002                      | B-Sand          | 1                 | Х                | Х     | Х                   | Х                      | х            | Х |        |                   |        |  |  |
|                             |                 |                   |                  |       | Quarterly Monitor   | ing                    |              |   |        |                   |        |  |  |
| EWB001                      | B-Sand          | 2                 | Х                | Х     | Х                   |                        |              |   |        |                   |        |  |  |
| EWC001                      | C-Sand          | 3                 | Х                | Х     | Х                   |                        |              |   |        |                   | Х      |  |  |
|                             |                 |                   |                  |       | Quality Control Sam | ıples <sup>9</sup>     |              |   |        |                   |        |  |  |
| Duplicates (1 per 20 wells) |                 |                   |                  | x (1) |                     |                        |              |   |        |                   |        |  |  |
| Rinseate Blanks (1 per day) | ·               |                   |                  | x (1) |                     | ·                      |              |   |        |                   |        |  |  |
| Trip Blanks (1 per day)     |                 |                   |                  | x (1) |                     |                        |              |   |        |                   |        |  |  |

### Notes:

55% - EPA Tier 1 validation (0 sample this event)

40% - EPA Tier 2 validation (0 sample this event)

5% - EPA Tier 3 validation (1 sample this event)

<sup>&</sup>lt;sup>1</sup> VOCs = Volatile organic compounds by EPA Method 8260B

<sup>&</sup>lt;sup>2</sup> Field Parameters = pH, Dissolved oxygen (DO), oxidation-reduction potential (ORP), turbidity, Electrical Conductivity (EC), temperature, and ferrous iron.

<sup>&</sup>lt;sup>3</sup> Total organic carbon (TOC) by EPA Method 9060 Modified or 415.1 or equal

<sup>&</sup>lt;sup>4</sup> Volatile Fatty Acids by Ion Chromatography (IC) by Microseeps

<sup>&</sup>lt;sup>5</sup> Dissolved gases (ethane, ethane and methane) by RSK 175

<sup>&</sup>lt;sup>6</sup> Minerals (sulfate, nitrite, nitrate, and chloride) by EPA Method 300 Series or equal, Total alkalinity by EPA Method 310 or equal

<sup>&</sup>lt;sup>7</sup> qPCR =Quantitative Polymerase Chain Reaction test for Dehalococcoides bacteria and functional gene analyses for the three reductase (RDase) genes - tceA (TCE RDase), vcrA, and bvcA (BAV1 RDase) - By Northwind Environmental

<sup>&</sup>lt;sup>8</sup> Approximately 10 percent of the laboratory data for the primary samples will be selected randomly for data validation as follows.

<sup>&</sup>lt;sup>9</sup> Quality control sample number based on estimated number of sampling days.







# **INSTRUMENT CALIBRATION SHEET**

Project Name: Boeing Former C-6 - Dec. 2007 Project #: 1155.003

| Date  | Time   | Instrument Type                         | Instrument<br>Serial No.   | Calibration<br>Method  | Calibrated by | Remarks  |
|---|--|---|--|--|---------------|--|
| 12/12/07  | 8:00   | SOLINST                                 | SOLINST #1   | STEEL TAPE   | EMC           | 25.0' = 25.1"  |
|   | 7:40   | HORIBA U-22                             | HORIBA #1  | 4 ـ 4م   | EML           | pH=4 h   |
|   |  |   |  | NTU = 0  |               | NTU=0 oh   |
| \.  |  |   |  | ORP = 83   |               | 012P= 82 ole   |
| <b> </b>  | ¥  | × ×                                     | *  | D.o. = 0   | <b>Y</b>      | D.o. = 0 ok  |
| 12/12/07  | 7:30   | MiniRAE PID                             | P10 # Z  | 100 AAM<br>180BUT.   | DML           | D.O. = O ok<br>100 ppm ok  |
|   |  |   |  |  |               |  |
| -   | Phasepainessassassassassassassassassassassassassa  |   |  |  |               |  |
|   | ***************************************  |   |  |  |               |  |
|   |  |   |  |  |               |  |
|   |  |   |  |  |               |  |
|   |  |   |  |  |               |  |
|   | ······································   |   |  |  |               |  |
| \$ 0,000 (1,0)(1,000 (1,0)(1,0)(1,0)(1,0)(1,0)(1,0)(1,0)(1,0) |  |   |  |  |               |  |
|   |  |   |  |  |               |  |
| 20290000000000000000000000000000000000  |  |   |  |  |               |  |
|   | ······   |   |  |  |               |  |
|   | and the second   |   |  |  |               | raceases a registrativa in interest (Medican parameter and a being the supplication of the desire and security in which is a security of the supplication of the suppl |
|   |  |   |  |  |               |  |
|   |  |   |  |  |               |  |
|   | ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,   |   |  |  |               |  |
| 222221120000000000000000000000000000000   | numeracconsumentation of the Print Manager Conservation Additional Conservation Additional Conservation Additional Conservation Additional Conservation Additional Conservation Conservatio |   |  | and the state of t |               |  |
|   |  |   |  |  |               |  |
|   | PERSONNING CONTRACTOR  |   | porcurrent minimizer consequence personal mentimination of several measurements are transcribed to the consequence of the conse |  |               |  |
|   |  | *************************************** | ***************************************  |  |               |  |
|   |  |   |  |  |               |  |
|   |  |   |  |  |               |  |
|   |  |   |  |  |               | чен күнийгийн байламий байлан дохооруун ойогч бөгөөгөөгөөгөөгөөгөөгөөгөөгөөгөөгөөгөөгө   |
|   |  |   |  |  |               |  |

# Groundwater Monitoring Well Gauging Sheet BCRE Former C-6 Facility

| Well ID | Previous<br>Measurement<br>Date | Previous<br>Depth to<br>Water | Previous<br>Total<br>Depth | Date     | Time  | Well<br>Diameter | PID (nnm) | Measurement<br>Point | Depth to<br>Water | Depth to<br>Water #2 | Total Depth | Personnel | Comments/Well Conditon |  |
|---------|---------------------------------|-------------------------------|----------------------------|----------|-------|------------------|-----------|----------------------|-------------------|----------------------|-------------|-----------|------------------------|--|
| EWB001  | Sep-07                          | 60.15                         | 88.95                      | 12/12/07 | 10:38 | 6"               | NO ACCESS | TOC-N                | 56.50'            | 56.50                | 85.5'       | EML       | G000                   |  |
| EWC001  | Sep-07                          | 59.8                          | 123.21                     | 12/12/07 | 12:15 | 4"               | 64.4      | TOC-N                | 60.10             | 60.10                | 122.34'     | EML       | 600D                   |  |
| EWB002  | Jun-07                          | 60.52                         | 94.3                       | 12/12/07 | 13:33 | 6"               | 0.0       | TOC-N                | 60.93             | 60.93                | 94.3'       | EML       | G00B                   |  |





# CONTINUMATED CAMDI INC DATA CHEET

| 0930 10:38 ~3.0 200 ~5 N/A    |   |                               |                                  |                         |   |  |  | 10:38                         | ENBOOL-  | _WG1216                                 | 107_0001          |  |  |  |
|-------------------------------|---|-------------------------------|----------------------------------|-------------------------|---|--|--|-------------------------------|--|---|-------------------|--|--|--|
| Purge Start<br>Time           | Purge End<br>Time                                     | Average<br>Flow<br>(gpm)      | Flow Gallons Volumes Water       |                         | 80% Red<br>Water Lev<br>(Cx0.80         | el Depth<br>0) – B                           | Water Leve<br>Sampling<br>Time (ft bm    | Collection (p) Time           | ·  |   |                   |  |  |  |
| 1037                          | 4.4   | 200                           | 3 /                              |                         | 7.7                                     | ≪8. + €                                      | , , , , ,                                | 0.770                         | 0.07   | <b>S</b>                                |                   |  |  |  |
| 10/1                          | <i>3.3 4.7</i>  | 200                           | 3 /                              | $\overline{}$           | 7.17                                    | 22.43  |  |                               |  | 5                                       |                   |  |  |  |
| 1005                          | 2.8   | 120                           | 3                                |                         | 7.18                                    | 22.39  |  |                               | 6.00   | -3                                      | 6.80              |  |  |  |
| 0951                          | 2.1   | 90                            | 3                                | $\rightarrow$           | 7.22                                    | 22.45  |  |                               | 0.00   | -19                                     | A 20              |  |  |  |
| 0946                          | 1.4   | 60                            | 3                                | $\setminus$             | 7.13                                    | 20.41  |  |                               | 0.00   | -19                                     | 0.70              |  |  |  |
| 0939                          | 0.7   | 30                            | 3                                |                         | 7.09                                    | 22.43  |  | 0.312                         | 0.00   | -26                                     | 6.3               |  |  |  |
| 0930                          |   | 0                             | 3 N                              | O ACES                  | 7:48                                    | 21.60  |  |                               | 0.00   | 7/42                                    | Clear B.O.        |  |  |  |
| Time                          | Casing/<br>Screen                                     | Volume<br>Purged<br>(gallons) | Flow<br>Rate<br>(gpm)            | /ater Level<br>(ft-bmp) | pri                                     | Tempera<br>(°C)                              | (NTU                                     | ) (M S/CM                     | ) Oxygen<br>(mg/L)                                   | (mV)                                    | Observations      |  |  |  |
| D Gallons                     | per foot of ca  | using 0.0                     | 2 0.1                            | 6 0.65                  | 1.47                                    | Well C                                       | Condition: G                             | COOD                          |  |   |                   |  |  |  |
| Well D                        | iameter (in)  | 0.7                           | 5 2                              | 4                       | <u></u>                                 |  |  | RMANENT Pu                    | MP AND PI  | PING                                    |                   |  |  |  |
|                               |   |                               | G                                | allons/Foot             |   | Field  | Equipment: <sub>//</sub>                 | LORIBA MUL                    | n PARAMETE   | n Mene                                  | FR                |  |  |  |
| NONE                          | 56.5'   | 85.5                          | 28.9                             | 5' N,                   | 19 42                                   | 255  | 128                                      |                               |  |   |                   |  |  |  |
| Depth to<br>LNAPL<br>(ft-bmp) | Depth to Static Well Total Water Depth Level (ft-bmp) |                               | Wate<br>Colur<br>Height<br>(A-B= | nn Thick<br>(ft) (ft-h  | APL Ca<br>kness Vo<br>imp) (ga          | ne (1)<br>asing<br>blume<br>illons)<br>XD=E) | Three (3) Casing Volumes (gallons) (Ex3) | 1/2 Casing<br>Volume<br>(E/2) | Above<br>screen<br>Volume<br>(Top Screen<br>- DTW)xD | Screen<br>Volume<br>(Screer<br>Length x | 1/2 Screen Volume |  |  |  |
| neasurement                   | Point Descri  | B B                           | - /V                             |                         |   | E .  | ump make.                                | <i>U.</i> 73                  | - Corceiii S   | 0                                       | /- <u>-</u>       |  |  |  |
| Well Identifica               |   | 800/                          | -1                               |                         |   |  | ump Intake:                              |                               |  |   |                   |  |  |  |
|                               |   |                               |                                  |                         |   |  | Veather: Junn                            |                               |  |   |                   |  |  |  |
| Project No.:                  | 1155.00   |                               | <u> </u>                         |                         | • |  | repared by: 🗲                            |                               |  |   |                   |  |  |  |
| roiect Name                   | : BOENG F   | Tomas C-                      | 6 - DE                           | EMBER 1                 | COF WAR                                 | 2 D  | ate: 12/13                               | 1/07                          |  |   |                   |  |  |  |

(AFTER) 95533

AFTER 5 volumes.

CHEMETRICS: 0.3 Mg/L @ 9:39

VARIABLE - DIFFICULT
TO CONTROL

Ly 0.70 mg/L @ 9:46; 0.80 mg/L @ 10:05.

VUSETS Symrendina AVOCET Desktop & conductor and the data sheet. doc



# **GROUNDWATER SAMPLING DATA SHEET**

| Vell Identification           | //55.00<br>on: <i>EW</i>                         |                              |           | 5666                                   |                                      |                        |   |         |  | 12/07                        |  |  |                      |  |  |
|-------------------------------|--|------------------------------|-----------|--|--------------------------------------|------------------------|---|---------|--|------------------------------|--|--|----------------------|--|--|
| Vell Identification           | on: EW   |                              |           |  |                                      |                        |   | Prepare | ed by: En                              | 10                           |  |  |                      |  |  |
| Aeasurement Po                |  |                              |           |  |                                      |                        |   | Weathe  | er: Junn                               | y 70's                       |  |  |                      |  |  |
| 1                             |  |                              | TOC-1     | /                                      |                                      |                        |   | Pump I  |  |                              |  |  |                      |  |  |
|                               | Α  | В                            | 700 7     | C                                      |                                      |                        | E                                       | T .     |  | 20'                          |  |  |                      |  |  |
| Depth to<br>LNAPL<br>(ft-bmp) | Depth to<br>Static<br>Water<br>Level<br>(ft-bmp) | Well To<br>Dept<br>(ft-br    | th   ,    | Water<br>Columi<br>leight (i<br>(A-B=C | t) Thick                             | APL<br>(ness<br>(mp) ( | One (1) Casing Volume (gallons) (CXD=E) |         | ee (3) sing 1 umes llons)              | /2 Casing<br>Volume<br>(E/2) | Above<br>screen<br>Volume<br>(Top Screen<br>- DTW)xD   | Screen<br>Volume<br>(Screen<br>Length x D) | 1/2 Screet<br>Volume |  |  |
| UONE G                        | 60.10  | 122.3                        | 4 (       | 62.24                                  | KOA                                  | UE                     | 41                                      | /2      | 3                                      | -                            | distribution of the last of th |  |                      |  |  |
|                               |  |                              |           | Gall                                   | ons/Foot                             | 1                      | Field                                   | d Equip | ment: 46/                              | IBA MUL                      | TPARAMETE  | NOTEN                                      |                      |  |  |
| Well Dian                     | meter (in)                                       |                              | 0.75      | 2                                      | (4)                                  | 6                      |   |         |  |                              | REDI-FLO   |  |                      |  |  |
| D Gallons per                 |  | sing                         | 0.02      | 0.16                                   | 0.65                                 | 1.47                   |   |         | ion: God                               |                              | /(()//-0/  | , <u> </u>                                 |                      |  |  |
| Time                          | Casing/<br>Screen                                | Volume<br>Purged<br>(gallons | Rate      | ∍   vva<br>∍ /₁                        | ter Level<br>t-bmp)                  | рН                     | Temper<br>(°C                           |         | Turbidity<br>(NTU)                     | Conductiv                    |  | 1 (m\/)                                    | Observations         |  |  |
| ///30                         | _  | 0                            | <b>2.</b> |  | /-/0                                 | 6.16                   | 22.4                                    | '/      | 148.0                                  | 0.143                        | 6.25   |  | Cloudy               |  |  |
| 1144                          | 0.7  | 30                           | 2.        |  | 1.22                                 | 6.78                   | 22.8                                    | PS      | 12.6                                   | 0./74                        | 0.00   | 1 _ 1                                      | leor                 |  |  |
| 1158                          | 1.5  | 60                           | a-        | 7 6                                    | 1.24                                 | 6.88                   | 22.8                                    |         | 5.4                                    | 0.176                        | 0.00   |  | Mear                 |  |  |
| 1210                          | 2.2  | 90                           | 2.        | i i                                    | 1. 29                                | 6.91                   | 22.8                                    |         | 6.0                                    | 0.177                        | 0.00   |  | Clear                |  |  |
| 1214                          | 3.0  | /23                          | J.        | 9 6                                    | 1.30                                 | 6.90                   | 22.8                                    | P8      | 6.1                                    | 6.177                        | 0.00   | -194                                       | Clear                |  |  |
|                               |  |                              |           |  |                                      |                        |   |         |  |                              |  |  |                      |  |  |
| Purge Start F                 | Purge End  | Avera<br>Flow<br>(gpm        | i Ga      | otal<br>illons<br>urged                | Total<br>Casing<br>Volumes<br>Purged | Water L                | Recovery<br>evel Depti<br>.80) – B      | h ∣ S   | ter Level at<br>ampling<br>ne (ft bmp) | Collection                   |  | Sample Identification                      |                      |  |  |
| 11:30                         | 12:14  | 2                            | 1.        | 23                                     | 3                                    | 40                     | 0                                       |         | 61.30                                  | 12:15                        | EWCOO!   | 1-66-1212                                  |                      |  |  |



# **GROUNDWATER SAMPLING DATA SHEET**

| Project Name                  | : BOEING A                                       | GRMEN                          | C-6 - 2                  | PECEMI                             | sen 2                               | 007 00               | R                                   | Date:       | 10                                      | 2/12/07                       |  |   |                     |  |  |  |
|-------------------------------|--|--------------------------------|--------------------------|------------------------------------|-------------------------------------|----------------------|-------------------------------------|-------------|---|-------------------------------|--|---|---------------------|--|--|--|
| Project No.:                  | 1155.00  | 02                             |                          |                                    |                                     |                      |                                     | Prepar      | ed by: $\epsilon$                       | MC                            |  |   |                     |  |  |  |
| Well Identifica               |  |                                |                          |                                    |                                     |                      |                                     | Weath       | er: Summ                                | 1 70'5                        |  |   |                     |  |  |  |
| Measurement                   |  |                                | C- N                     |                                    |                                     |                      |                                     | Pump l      |   | 843'                          | Screen: 60'-90'                                      |   |                     |  |  |  |
|                               | A  | В                              |                          | С                                  |                                     |                      | E                                   |             |   |                               |  |   |                     |  |  |  |
| Depth to<br>LNAPL<br>(ft-bmp) | Depth to<br>Static<br>Water<br>Level<br>(ft-bmp) | Well Tota<br>Depth<br>(ft-bmp) | al Co<br>Hei             | Vater<br>Dumn<br>ght (ft)<br>-B=C) | Thick                               | APL<br>kness<br>omp) | ss Volume                           |             | ree (3) asing 1 umes ters) Ex3)         | I/2 Casing<br>Volume<br>(E/2) | Above<br>screen<br>Volume<br>(Top Screen<br>- DTW)xD | Screen<br>Volume<br>(Screen<br>Length x E | 1/2 Scree<br>Volume |  |  |  |
| NONE                          | 60.93  | 94.30                          | 33                       | .37                                | 4/4                                 | 7                    | 186                                 | 55          | 7                                       |                               |  |   | - Contractions      |  |  |  |
|                               |  |                                |                          | Liters                             | Foot                                |                      | Fiel                                | d Equip     | ment: 🚜                                 | RIBA Mu                       | LAPARAMETE   | R Mere                                    | T.                  |  |  |  |
| Well D                        | iameter (in)                                     | 0                              | .75                      | 2                                  | 4                                   | 6                    |                                     |             |   |                               | LADDER Pul   |   |                     |  |  |  |
| D Liters p                    | er foot of cas                                   | sing 0                         | .08                      | 0.61                               | 2.46                                | 5.56                 |                                     |             | tion: 60                                |                               | •  |   |                     |  |  |  |
| Time                          | Casing/<br>Screen                                | Volume<br>Purged<br>(liters)   | Flow<br>Rate<br>(ml/min) | Water<br>(ft-bi                    | accondition of the same of          | рН                   | Tempe                               |             | Turbidity<br>(NTU)                      | Conductiv                     |  | ORP<br>(mV)                               | Observations        |  |  |  |
| /3/0                          | NA   | O                              | 200                      | 61.0                               | 2                                   | 6.63                 | 21.0                                | 3P          | 7.2                                     | 0.338                         |  | -110                                      | Clear               |  |  |  |
| 1313                          | N/A  | 0.6                            | 200                      | 61.                                |                                     | 6.53                 | 21.0                                | 89          | 2.0                                     | 0.352                         | 0.17   | -114                                      | Clear               |  |  |  |
| 1316                          | NA   | 1.2                            | 200                      | 6/.1                               | 5                                   | 6.52                 | 21.                                 | -           | 1.5                                     | 0.345                         | 0.00   | -120                                      | Clear               |  |  |  |
| 1319                          | N/A  | 1.8                            | 200                      | 61.0                               | 07                                  | 6.55                 | 21.                                 |             | 1.8                                     | 0.337                         | 0.00   | -/22                                      | Char                |  |  |  |
| 1322                          | N/A  | 2.4                            | 200                      | 61.                                | 07                                  | 6.53                 | 21.                                 | 88          | 2.0                                     | 6.335                         | 6.00   | -/21                                      | Clear               |  |  |  |
| 1325                          |  | 3.0                            | 200                      | 61.0                               | 02                                  | 6.53                 | 21.                                 |             | 1.9                                     | 0.334                         | 0.00   | -/2/                                      | Clear               |  |  |  |
| 1328                          | N/A<br>N/A                                       | 3.6                            | 200                      | 61.1                               | 07                                  | 6.53                 | 21.0                                |             |   |                               | -120   | Clear                                     |                     |  |  |  |
| Purge Start<br>Time           | Purge End<br>Time                                | Average<br>Flow<br>(ml/min)    | Tota<br>Lite<br>Purg     | rs V                               | Total<br>Casing<br>clumes<br>Purged | Water I              | Recovery<br>_evel Dept<br>0.80) – B | th S<br>Tin | ter Level at<br>Sampling<br>ne (ft bmp) | Collection                    |  |   |                     |  |  |  |
| 13:10                         | 13:28  | 200                            | 3.4                      |                                    | N/A                                 | _                    | - 61.07 13:33 EWB002_W              |             |   |                               | - WE1216   | 207_0001                                  |                     |  |  |  |



# QA/QC SAMPLE IDENTIFICATION FORM

Project Name: BOEING FORMER C-6 - DEC. 2007

Project No.: //55.002

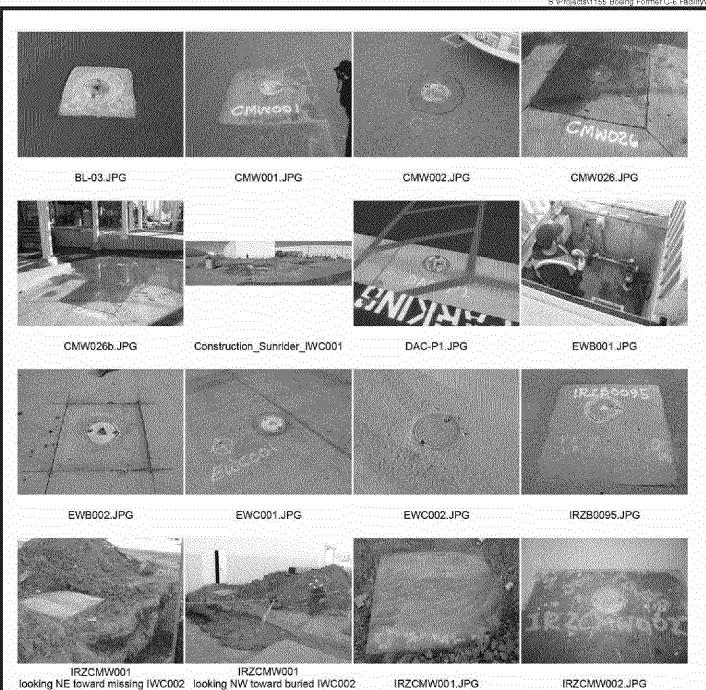
| Date     | Time                                   | QA/QC Sample<br>Type<br>(Duplicate, Field Blank,<br>Equipment Blank, Split) | Sample ID  | Sample<br>Location                     | Primary Sample<br>Reference | Analytical<br>Methods | Organic-Free<br>Water Source | Field<br>Personnel | Comments |
|----------|--|---|--|--|-----------------------------|-----------------------|------------------------------|--------------------|----------|
| 12/12/07 |  | Trip  | TB_AV121207_000                                    | , c-6                                  |                             | 8260B                 | TESTAMERIC                   | A W/A              |          |
| 12/12/07 | _                                      | EQUIP. 6  | B AV12/207_100                                     | 1 C-6                                  |                             | 8260B                 | // /1                        | EML                |          |
| 12/12/07 | -                                      | Dup.  | TB_AVI21207_000<br>B_AVI21207_000<br>EWCOOI_WG1212 | 07_0002                                | CL                          | 8260B                 | N/A                          | EML                | ****     |
|          |  |   |  |  |                             |                       |                              |                    |          |
|          |  |   |  |  |                             |                       |                              |                    |          |
|          | ······································ |   |  |  |                             |                       |                              |                    |          |
|          |  |   |  |  |                             |                       |                              |                    |          |
|          |  |   |  |  |                             |                       |                              |                    |          |
|          |  |   |  |  |                             |                       |                              |                    |          |
|          | ······                                 |   |  | · · · · · · · · · · · · · · · · · · ·  |                             |                       |                              |                    |          |
|          |  |   |  |  |                             |                       |                              |                    |          |
|          |  |   |  |  |                             |                       |                              |                    |          |
|          |  |   |  |  |                             |                       |                              |                    |          |
|          | ,                                      |   |  |  |                             |                       |                              |                    |          |
|          |  |   |  |  |                             |                       |                              |                    |          |
|          |  |   |  |  |                             |                       |                              |                    |          |
|          | ·····                                  |   |  |  |                             |                       |                              |                    |          |
|          |  |   |  | ······································ |                             |                       |                              |                    |          |
| ·····    |  |   |  |  |                             |                       |                              |                    |          |

| AVOCET  ENVIRONMENTAL, INC.  16 Technology Drive, Suite 154  Irvine, California 92618-2327  TEL (949) 296-0977 |                      |                 |                            |        |                                       |                    | S        | heet                            | **             | of  | Boeing CoC No. AVO12                                 |  |                                    |  |     |        |         | oC No. AVO121207A |         |       |     |   |                  |
|--|----------------------|-----------------|----------------------------|--------|---------------------------------------|--------------------|----------|---------------------------------|----------------|---|--|--|------------------------------------|--|-----|--------|---------|-------------------|---------|-------|-----|---|------------------|
| ENVIR  | OUL COMMENTAL, II    | <b>L</b><br>ne. | irvine,                    | TEL (9 | 9 92618-2<br>949) 296-0<br>949) 296-0 | 977                |          |                                 |                |   | CI   | 1A   | IN                                 | OFC  | US  | TC     | )D      | ΥF                | RE(     | cc    | )Ri | D |                  |
| Project Information  | n:                   |                 |                            |        |                                       |                    |          |                                 |                |   |  |  |                                    |  | An  | alyses |         |                   |         |       |     |   |                  |
| Site Name  | Boeing Forme         | er C-6 Facilit  | y - Buildin                | g 1/36 |                                       |                    | -        |                                 |                |   | and  | 300  |                                    | ction<br>gene<br>nd<br>nd  |     |        |         |                   |         |       |     |   |                  |
| Site Address   | Torrance, CA         | <del></del>     |                            |        |                                       | <del></del>        | 1        | <u>@</u>                        |                | PA)   | ine,   | Nitrate,<br>Method   | 310                                | Rea<br>RNA<br>A, al  |     |        |         |                   |         |       |     |   |                  |
| Project No.  | 1155.002             |                 |                            |        |                                       |                    | -        | 3260                            |                | d.  | Ethe   | Nit<br>M M   | pou                                | hain<br>6S r<br>bvc<br>bvc   |     | ŀ      |         |                   |         |       |     |   |                  |
| Project Manager  | Michael Rend         | ina             | wv                         |        |                                       |                    |          | PA                              |                | 23G<br>burg   | ane,   | lfate<br>EP  | Me                                 | Poc A  |     |        |         |                   |         |       |     | ĺ |                  |
| Sampled By   | Eric Costales        |                 |                            |        |                                       |                    | -        | /s (E                           |                | 1 8M<br>Pitts   | (Eth:<br>175)  | s (st  | EP/                                | nera<br>or Di<br>es t  |     |        |         |                   |         |       |     |   |                  |
| Turn-Around-Time   | Standart TAT,        | 48 hr holdii    | g time for NO <sub>3</sub> |        |                                       |                    | 4        | Xo la                           | (090           | athor<br>Ing.   | ses  | neral<br>lorid   | y by                               | sis fe   |     |        |         |                   |         |       |     |   |                  |
| Sample Ide   | ntification          | Sample<br>Date  | Sample<br>Time             | Matrix | No. of<br>Cntnrs.                     | Lab I.D.<br>Number |          | VOCs inc. fuel oxys (EPA 8260B) | TOC (EPA 9060) | VFA by IC Method 8M23G<br>(Microseeps, Ing. Pittsburgh, | Dissolved Gases (Ethane, Ethene, Methane by RSK 175) | Dissolved Minerals (sulfate, nitrite, and chloride) by EPA | Total Alkalinity by EPA Method 310 | Quantitative Polymerase Chain Reaction (qPCR) analysis for DHC 16S rRNA gene and functional genes toad, bvcA, and vcrA (North Wind, Inc., Pocatello, ID) |     |        |         |                   |         |       |     |   | Comments         |
| TB_AV121207_   | 0001                 | -               | -                          | Water  | 3                                     |                    |          | х                               |                |   |  |  |                                    |  |     |        |         |                   |         |       |     |   |                  |
| EB_AV121207_   | 0001                 | 12/12/07        | 11715                      | Water  | 3                                     |                    |          | Х                               |                |   |  |  |                                    |  |     |        |         |                   |         |       |     |   |                  |
| EWB002_WG12  | 21207_0001           | 12/12/07        | 13:33                      | Water  | 12                                    |                    |          | Х                               | Х              | х   | х  | Х  | Х                                  | х  |     |        |         |                   |         |       |     |   | 48HR HT for NO 3 |
| EWB001_WG12  | 21207_0001           | 12/12/07        | 10:38                      | Water  | 3                                     |                    |          | х                               |                |   |  |  |                                    |  |     |        |         |                   |         |       |     |   |                  |
| EWC001_WG12  | EWC001_WG121207_0001 |                 |                            |        |                                       |                    |          | х                               |                |   |  |  |                                    |  |     |        |         |                   |         |       |     |   |                  |
| EWCOOLWG12   | 1207 0002            | 12/12/07        | 12:15                      | Water  | 3                                     |                    |          | X                               |                |   |  |  |                                    |  |     |        |         |                   |         |       |     |   |                  |
|  |                      |                 |                            |        |                                       |                    | -        |                                 |                |   |  |  |                                    |  |     |        | _       | _                 |         |       |     |   |                  |
|  |                      |                 |                            |        |                                       |                    | -        | -                               |                |   | -  | -  | -                                  |  |     |        |         | -                 | -       | -     |     |   |                  |
|  |                      |                 |                            | ···    |                                       |                    | <u> </u> | ļ                               |                |   | ļ  |  |                                    |  |     |        |         |                   |         |       |     |   |                  |
|  |                      | -               |                            |        |                                       |                    | <u> </u> |                                 |                |   |  |  |                                    |  |     |        |         | $\perp$           | ļ       |       |     |   |                  |
|  |                      |                 |                            |        |                                       |                    |          |                                 |                |   |  |  |                                    |  |     |        |         |                   |         |       |     |   |                  |
|  |                      |                 |                            |        |                                       |                    |          |                                 |                |   |  |  |                                    |  |     |        |         |                   |         |       |     |   |                  |
|  |                      |                 |                            |        |                                       |                    |          |                                 |                |   |  |  |                                    |  |     |        |         |                   |         |       |     |   |                  |
| Relinquished by  |                      |                 |                            | Cor    | npany                                 |                    |          |                                 |                | Recei   | ved by   |  |                                    |  |     |        |         |                   | Con     | npany | ,   |   |                  |
| Printed Name:  | wid Liebe.           | 170-1           | Date: 12-1                 | \      | vocet Env                             | ironmental In      |          |                                 |                | Printed   | Name:  |  | ******                             |  |     | Da     | ite;    |                   |         |       |     |   |                  |
| Signature: Time: 16:58 Avocet Environmental  |                      |                 |                            |        |                                       | ilosificiliai, ili | ···      |                                 |                | Signati   | ıre;   |  |                                    |  |     | Tir    | ne:     |                   |         |       |     |   |                  |
| Printed Name: Date:  |                      |                 |                            |        |                                       |                    |          |                                 |                | l l   | Name:  |  |                                    |  |     |        | ite:    |                   |         |       |     |   |                  |
| Signature: Time:   |                      |                 |                            |        |                                       |                    |          |                                 |                | Signate   |  |  | _                                  |  | 1   |        | ne:     |                   | -       |       |     |   |                  |
| Printed Name:  |                      |                 | Date:                      |        |                                       |                    |          |                                 |                |   | Name:  |  | 0                                  | MOTO   | (1e |        | ite: \? |                   | 1       |       |     |   |                  |
| Signature: Time:   |                      |                 |                            |        |                                       |                    |          | Signati                         | ure;           |   |  |  | $\preceq^{\vee}$                   | <b>√</b> Ţįi   |     | 1650   |         |                   |         |       |     |   |                  |
| Total Containers   |                      |                 |                            |        |                                       | Billi              | ng Inf   | ormatic                         | in             |   |  | -  | -                                  |  |     |        |         | Special :         | Instruc | tions |     |   |                  |
| Total Containers  Temperature  OF  Bill To:  |                      |                 |                            |        |                                       |                    |          |                                 |                |   |  |  |                                    |  |     |        |         |                   |         |       |     |   |                  |

S:Projects\1155 Booing Former C-6 Facility\Groundwater Monitoring\December 2007\COC\_121207.xis

COC Seal (Y/N/NA)

11 4. 1.



(Page 1 of 6)

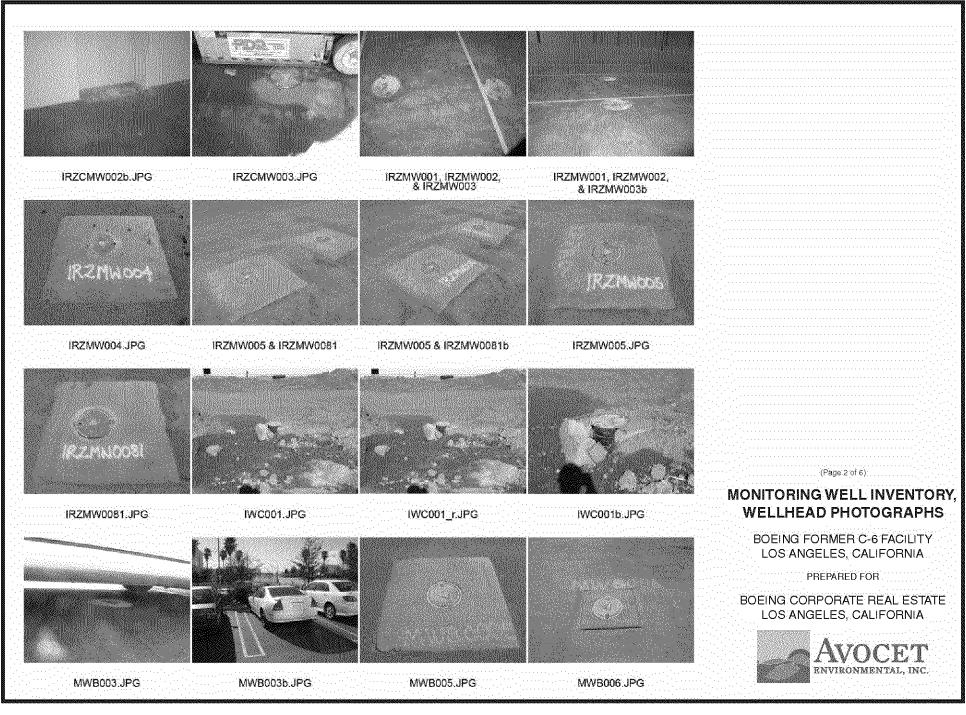
# MONITORING WELL INVENTORY, WELLHEAD PHOTOGRAPHS

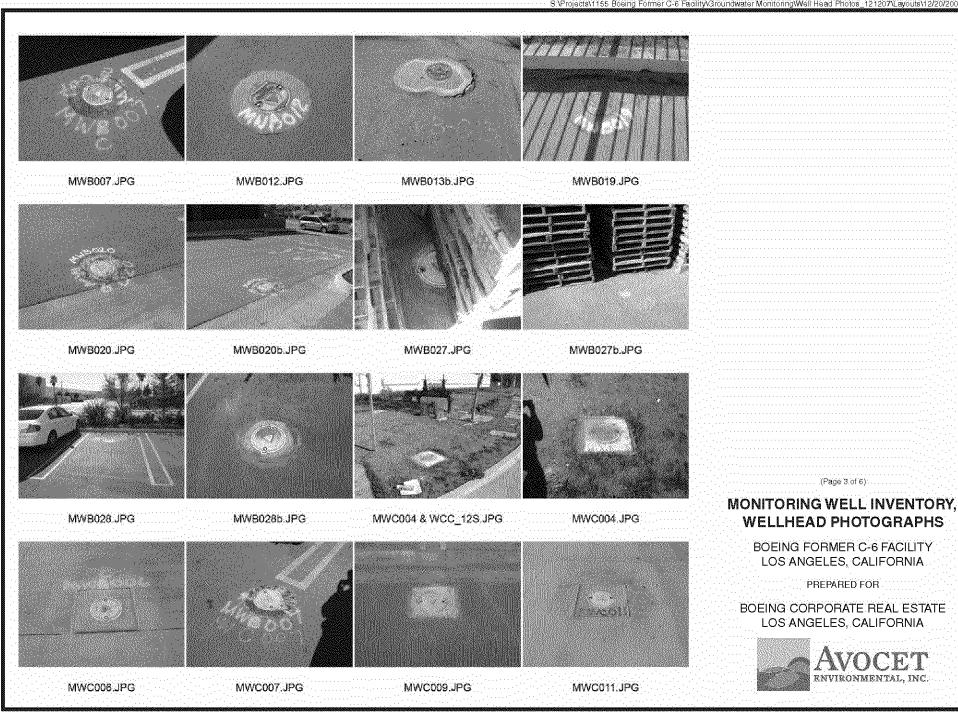
BOEING FORMER C-6 FACILITY LOS ANGELES, CALIFORNIA

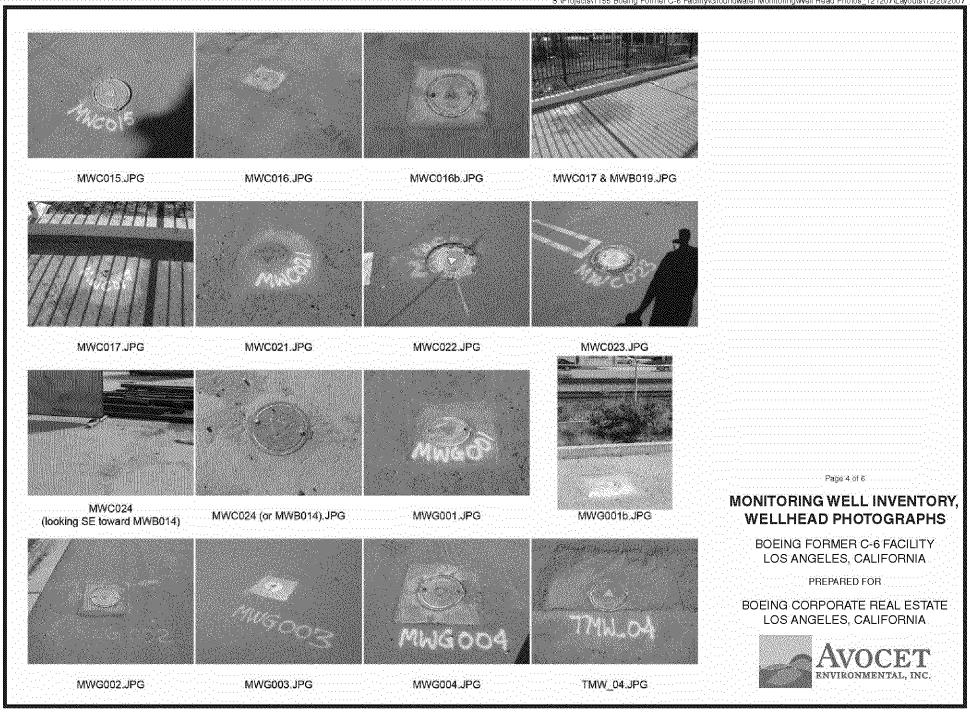
PREPARED FOR

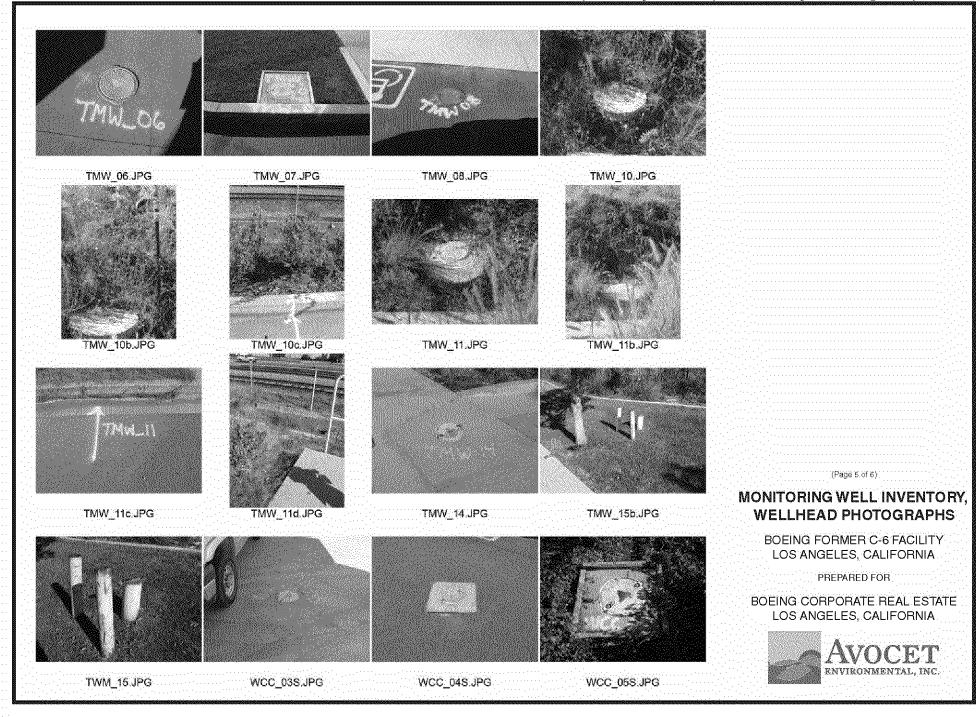
BOEING CORPORATE REAL ESTATE LOS ANGELES, CALIFORNIA



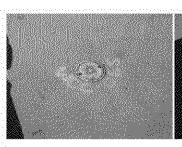


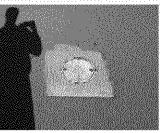












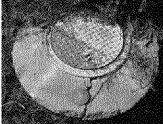


WCC\_06S.JPG

WCC\_07S.JPG

WCC\_09S.JPG









WCC\_12S.JPG

XMW\_19.JPG

XMW\_19c.JPG



XMW-09,JPG

### MONITORING WELL INVENTORY. **WELLHEAD PHOTOGRAPHS**

BOEING FORMER C-6 FACILITY LOS ANGELES, CALIFORNIA

PREPARED FOR

BOEING CORPORATE REAL ESTATE LOS ANGELES, CALIFORNIA

